

Clement Le Neve Foster died, and it has therefore not had the advantage of his exceptional technical knowledge, literary skill, and critical acumen in its final revision. His loss to the Home Office is a serious one, and it will be difficult to find an editor with his wide acquaintance with foreign mining literature to fill his place.

The information given in the report deals with the number of persons employed, the quantity and value of minerals produced, and the loss of life from accidents in mines and quarries throughout the world. The statistics given in this concise, intelligible and inexpensive form are of the greatest importance from a commercial point of view. In the United Kingdom alone the value of the minerals produced in 1902, the year under review, was 107,104,884*l.*, and the vast sums representing British capital invested in mines in all parts of the world will be readily appreciated. Some indication of the growth of the mining industry during recent years is indicated by the following comparison of the world's output of metals in 1889 and in 1902:—

		1889 Metric tons		1902 Metric tons
Iron ... ..	...	26,000,000	...	42,669,000
Gold ... ..	...	182	...	447
Silver ... ..	...	3,900	...	4,753
Copper ... ..	...	266,000	...	572,000
Lead ... ..	...	549,000	...	803,000
Zinc ... ..	...	335,000	...	503,000
Tin ... ..	...	55,000	...	93,000

In 1902 the world produced 803,157,000 tons of coal, 22,869,000 tons of petroleum, and 13,279,000 tons of salt. Of the coal supply, 34 per cent. was furnished by the United States, 29.5 per cent. by the United Kingdom, and 19.4 per cent. by Germany. Although the United States outstripped Great Britain in production, the value of the British product was 93,521,000*l.*, whilst that of the American was 75,373,000*l.*

As gold producers, the British possessions take the first place, furnishing more than half the world's supply. Australia supplied 24 per cent., the Transvaal 12 per cent., and Canada 7 per cent. of the total. The United States contributed 27 per cent. The value of the total production exceeds 60,000,000*l.* Nearly one-fourth of the world's salt and three-fifths of the tin are produced by the British Empire. On the other hand, the production of copper, lead, petroleum, silver, and zinc is small in comparison with the world's output. Of copper, the United States, with the enormous output of 299,000 tons, produce more than half the copper of the world, and Spain and Portugal together about one-tenth. The United States also produce most lead, 30 per cent. of the world's total, Spain and Germany following. Russia and the United States are the two great petroleum producers. In the British Empire, Canada and Burma are the only oil regions, and their production is comparatively small. Of silver, the United States again are the largest producers, followed closely by Mexico. The German Empire, with its rich Silesian mines, is the leading zinc-producing country, furnishing one-third of the world's supply. The United States take second place in the list. Of other valuable minerals raised in 1902, diamonds to the value of 4,950,000*l.* were produced in Cape Colony. Italy has no equal for its sulphur (value 1,706,000*l.*), Chili for its nitrate of soda (value 9,500,000*l.*), Germany for its potassium salts (value 2,000,000*l.*), Spain for its mercury (value 173,000*l.*), and the United States for their phosphates (value 1,000,000*l.*).

Any strictly accurate comparison between the number of persons employed in the mining industries of the various countries is impossible. The figures collected

are, however, sufficient to give a general idea of the relative importance of mining in each country. The total number of persons engaged in mining and quarrying throughout the world may be taken at 4,500,000, of whom one-fifth are employed in the United Kingdom and one-third in the British Empire. More than half the total number were employed in mining coal, Great Britain employing 750,000, the United States and Germany each 500,000, France 165,000, Belgium 135,000, Austria 123,000, and India 100,000.

The accident statistics are not so complete as might be wished. For coal mines, the figures show that the death rate from accidents in mines and quarries per 1000 persons employed is 1.24 in the United Kingdom, 1.46 in the British Empire, 1.09 in France, 1.93 in Germany, and 3.25 in the United States. The death rate for foreign countries generally is 2.20. It is evident that mining is conducted in Great Britain with a far smaller risk of accident to the workers than in most other countries.

The first part of the general report on mines and quarries for 1903 has also been issued. It contains statistics of the number of persons employed, the output of minerals, and the number of accidents in the United Kingdom. The British production in 1903 included 230,334,469 tons of coal, 16,198,021 tons of clays and shale, and 13,715,645 tons of iron ore.

B. H. B.

NOTES.

IN the long list of birthday honours published on Friday last, we notice that Mr. Charles Booth, F.R.S., has been made a Privy Councillor; and that the honour of knighthood has been conferred upon Prof. J. Dewar, F.R.S., and Dr. T. Stevenson, scientific analyst to the Home Office. The Colonial Office list includes the name of Prof. W. Baldwin Spencer, F.R.S., who has been appointed a Companion of the Order of Saint Michael and Saint George (C.M.G.).

H.R.H. PRINCESS HENRY OF BATTENBERG will privately inaugurate the annual exhibition of the Beni Hasan excavations committee at the rooms of the Society of Antiquaries in Burlington House. The exhibits include the antiquities discovered at Beni Hasan and Negada by Mr. John Garstang, reader in Egyptian archaeology in the University of Liverpool, and paintings by Mr. Harold Jones, artist to the expedition. The exhibition will be open from July 8-23 inclusive.

THE French Society of Civil Engineers has this year awarded its prizes as follows:—the annual prize to M. J. Bernard for his work on the installation in the Red Sea of three lighthouses in circumstances of especial difficulty. The Michel Alcan prize was awarded to M. L. Guillet for his researches on the composition of steel, and the F. Coignet prize went to M. V. Picou for his work on the regulation of dynamos. A prize was awarded to Prof. E. Hospitalier for his works on the study of phenomena which by their rapidity and frequency baffle ordinary methods of analysis.

H.R.H. THE PRINCE OF WALES has consented to become patron of the Royal Meteorological Society.

THE twenty-second congress of the Sanitary Institute will be held in Glasgow from July 25-30, under the presidency of Lord Blythwood. Sir Richard Douglas Powell, Bart., K.C.V.O., will deliver the lecture to the congress on "The Prevention of Consumption." It appears from the programme that 250 authorities, including several county

councils and county boroughs, have already appointed delegates to the congress, and as there are more than 3300 members and associates in the institute, there will probably be a large attendance in addition to the local members. In connection with the congress, a health exhibition of apparatus and appliances relating to health and domestic use will be held as practical illustration of the application and carrying out of the principles and methods discussed at the meetings. Popular lectures will be given in the exhibition on physical development, by Dr. P. Boobyyer; care of eyesight, by Dr. James Kerr; care of the teeth, by Mr. G. Cunningham; feeding and digestion, by Prof. A. Bostock Hill; and healthy houses, by Prof. H. R. Kenwood. The sections and their presidents are:—(1) Sanitary science and preventive medicine, Prof. J. Glaister; (2) engineering and architecture, Prof. H. Robinson; (3) physics, chemistry, and biology, Prof. Frank Clowes. There will be eight special conferences, the subjects and presidents of which will be as follows:—Municipal representatives, Mr. W. F. Anderson; industrial hygiene, Mr. J. Steele; medical officers of health, Sir C. A. Cameron, C.B.; engineers and surveyors to county and other sanitary authorities, Mr. W. Weaver; veterinary inspectors, Prof. James McCall; sanitary inspectors, Mr. T. F. Strutt; women on hygiene, the Duchess of Montrose; the hygiene of school life, Prof. John Edgar.

THE death is announced of Lieut.-General Dubrovin, who was for a long time secretary of the Imperial Academy of Sciences at St. Petersburg.

PROF. W. KAUFMANN, of Bonn, has been awarded the Von Baumgartner prize of the Vienna Academy.

PROF. VAN 't HOFF has been appointed honorary director of the medical faculty of Utrecht, and the newly erected chemical laboratory there has been named the Van 't Hoff Laboratory in his honour.

THE Imperial Academy of Sciences of Vienna announces the following grants:—To the Vienna Society for Solar Observation, 1600 krone for observations on climatic changes in the Goldberg glacier, and to Prof. Ritter Beck von Managetta (Prague) 600 krone for studies of plant distribution in the Julian Alps. From the Wedl bequest, to Drs. Obermayer and Pick (Vienna) 600 krone for the chemistry of immune substances, to Dr. Moritz Probst 800 krone for continuation of work on the brain, to Dr. Karl Camillo Schneider 400 krone for a zoological expedition to Grado, to Prof. Julius Tandler 1000 krone for studies in the development of birds. The committee of the Treitel legacy awards the following grants:—To Prof. Hans Skraup (Graz) 1500 krone for studies on albumens, to Dr. Franz Werner 6000 krone for a zoological expedition to the Egyptian Soudan, to Prof. Julius Wiesner 4000 krone for effects of light on plant life in the Yellowstone district, to the Austrian Meteorological Society 4000 krone for investigations of the upper atmosphere, and to the Earthquake Commission 5465 krone 39 heller.

THAT the depopulation of rural districts is a social problem of the times in France no less than in this country is evident from the report presented by Dr. A. F. Plicque to the *Bulletin de la Société d'Encouragement* for April. The author makes a special study of the conditions prevailing in the canton of Donnemarie-en-Montois (Seine et Marne). This canton is situated in the midst of a fertile agricultural district possessing an excellent climate, and within moderate distance of Paris, and from 1869 to 1891 there was a falling off in the population of from 9764 to 7683 inhabitants.

It is also noteworthy that an inquiry in 1893 in the same district showed that 63 per cent. of the farm labour was imported from outside, and that without this imported labour agriculture in this fertile region would come to a standstill. The author traces the causes of the depopulation to ignorance of sanitary precautions leading to a high rate of infant mortality, emigration of young people to towns, effects of conscription, alcoholism, &c., and he considers the remedy to consist in improvements in primary and technical education, which should, in his opinion, "not merely give the child verbal forms, devoid of ideas, which he cannot understand, but should give children of rural communities an instruction suited to the surroundings in which they ought to live, and should develop, from their earliest years, a taste for agriculture." M. Plicque instances the success of this method in Belgium. In other words, the successful and contented ploughboy should not be encouraged to leave his plough in order to become an unsuccessful and discontented teacher.

WOULD life be possible if the nitrogen of the atmosphere were replaced by hydrogen? This is a question discussed by Regnault and Reiset, who gave an affirmative answer in their well known treatise on respiration. A fresh investigation of the question is now given by Dr. Arturo Marcacci in the Lombardy *Rendiconti*, xxxvii., 9, whose experiments were conducted at Palermo. The author found that animals introduced into such an atmosphere soon died, the symptoms all indicating that the death was due to cold, caused by the high thermal conductivity of the hydrogen. Another phenomenon was the marked increase in the absorption of oxygen and evolution of carbonic anhydride.

IN 1902 the *Zeitschrift für Krystallographie und Mineralogie*, founded by Prof. P. Groth, completed the twenty-fifth year of its publication. Many mineralogists in various countries felt the occasion provided a fitting opportunity to commemorate the services rendered to mineralogy and crystallography by Prof. Groth by initiating and editing that journal. Profs. M. H. N. Story-Maskelyne, W. J. Lewis, H. A. Miers, and Mr. L. Fletcher formed themselves into a committee, and in response to an appeal a sufficient sum of money was obtained to secure the services of Prof. E. Grützner, of Munich, to paint a portrait of Prof. Groth. The picture was formally presented to Prof. Groth on April 30 last, and was accompanied by a letter from Prof. Story-Maskelyne expressing the appreciation of Prof. Groth's work on the part of the subscribers. A photogravure of the portrait, executed by Dr. E. Albert and Co., of Munich, and a statement of receipts and expenses, will be forwarded shortly to each subscriber to the testimonial.

A NEW scheme for a North Polar expedition was described by M. Charles Bénard at a meeting of about fifty men of science held in the house of the Prince of Monaco, in Paris, on June 19. According to the Paris correspondent of the *Times*, M. Bénard explained at length why the only feasible and rational route of penetration of the Polar Sea was one a little north of that followed by the *Fram*. The expedition ought to start from a Norwegian port, cross the southern portion of Barents Sea, take in dogs at Karabora, coast along Yalmal, ship its coal at Port Dickson, transported thither by special steamer, pass at the end of the summer along the Peninsula of Taimyr, arrive by the end of the autumn at the islands of New Siberia, and then, instead of going northward, as did the *Fram*, manage at all costs, even if it be necessary to winter in the Liakhoff or Bennett Islands, to reach a point on the 150th degree of east longitude. Thence the ship or ships need only drift with the

ice. M. Bénard urges the utility of having the expedition composed of two vessels in touch with each other by means of wireless telegraphy. The expedition should take three years, but be provisioned for five. It would not cost more than 1,500,000 francs (60,000*l.*). The assembled company signed a memorandum declaring this expedition to be of scientific utility.

At a recent meeting of the Royal Photographic Society, Mr. Conrad Beck described the unifocal (or unifocal) photographic objective which has been worked out by Dr. Steinheil, of Munich. The principle of the new construction consists in the employment of positive and negative lenses all of which have the same focal length and the same mean index of refraction, thus overcoming the difficulty of satisfying the "Petzval condition." A positive focus is obtained by separating the positive and negative elements. An example with a maximum aperture of $f/4.5$ appears at first sight like a symmetrical triplet consisting of three single lenses, with the central negative lens divided to allow space for the diaphragm. But the inner faces of the two negative lenses are concave to each other. In the series with an aperture of $f/6$, there is a greater space between the negative elements, each of which is much nearer to the outer positive component than it is more immediately associated with. Mr. Beck stated that even the $f/4.5$ lens gives telescopic central definition, perfect freedom from distortion and flare, and a flat field of 60° well corrected for astigmatism. An incidental advantage of the construction is that it gives a more even illumination, as oblique beams are transmitted more fully than when the elements of the combinations are in contact.

THE Paris correspondent of the *Times* states that M. Henri de la Vaulx is now completing his preparations for a third Mediterranean cruise in a specially constructed balloon, some particulars of which were given at Monday's sitting of the Academy of Sciences. M. de la Vaulx will employ a 20-horse power engine of the automobile type, attached to the car, which will work an aluminium screw seven metres in diameter.

A CORRESPONDENT informs us that the optical illusion mentioned in NATURE of June 2 (p. 107) is described in the *Proceedings* of the Royal Society of Edinburgh (vol. x., 1878-9). In the experiments described in that paper circular rotating discs, and also travelling bands of paper, were used for exciting the eye, and it is shown that whatever the nature of the motion impressed on the eye, the surface afterwards looked at appears to move in the opposite direction. If a rapidly flowing stream, for instance, be looked at steadily for a time, and the eye afterwards directed to the bank, part of the bank will seem to flow through the middle of the field of view. The image of the part of the bank that falls on the part of the retina affected by the image of the moving water seems to flow slowly in a direction contrary to that of the stream, causing that part of the solid earth to appear as if it had become plastic.

WE have received from M. A. Lancaster the *Annuaire Météorologique* of the Royal Observatory of Belgium for 1904. For sixty-eight years the observatory published annals devoted to astronomy and meteorology combined, but since 1901 each science has been dealt with separately. The work consists of some 660 pages, and, in addition to monthly and seasonal meteorological data for various places, contains some valuable papers by M. Lancaster and others connected with the service, including the motions of cirrus clouds, and the dispersion of hail clouds, by M. Vander-

linden. The latter subject is still a controversial matter, and although the results hitherto attained by shooting and other methods are not generally considered satisfactory, the experiments are likely to be continued for some years.

THE *Transactions* of the South African Philosophical Society (vol. xv., part i.) contain an important paper by Mr. J. R. Sutton on South African rainfall, being the fifth of a valuable series of studies on meteorological subjects which have appeared in the same publication. The tables exhibit the daily and monthly rainfall at Kimberley recorded by Mr. F. W. Matthews between 1877 and 1902, together with the diurnal variation and other useful details; also the monthly and annual rainfall at a large number of selected stations. The values relating to Kimberley have been discussed statistically and by the process of harmonic analysis. The yearly falls from Mr. Matthews's series vary from 9.34 inches in 1878 to 31.30 inches in 1891. The greatest average annual fall occurs at Maclear's Beacon, on Table Mountain (86.81 inches), and the least at Port Nolloth (2.46 inches). Speaking of the Kimberley values, Mr. Sutton states that March is the wettest and July the driest month, the increase or decrease from one to the other being gradual. Referring to South African rainfall generally, outside the Cape Peninsula and west coast, the author concludes that rainfall decreases on the whole with distance from the coast, and that it occurs with a high barometric pressure at Durban and a low pressure at Kimberley; it comes chiefly with south-westerly winds at the former station and with north-easterly winds at the latter. The principal barometric disturbances come from the south.

A SMALL brochure, in which Mr. G. M. Woodrow treats of the cultivation and varieties of the mango, "the choicest fruit of Hindustan," has been published by Mr. Alexander Gardner, of Paisley, and can be obtained from the office of the *Gardener's Chronicle* and certain agents in India.

IN the matter of floral variation, several of the violets offer an attractive field of study, and a paper by Mr. C. E. Britton dealing with floral variations among Surrey violets will be found in the *Journal of Botany* (May). The most important aberrations occur in the corolla, where, in the case of *Viola hirta*, all stages, from the normal single-spurred petal to the symmetrical condition of five-spurred petals, were observed. The condition of regular symmetry in the case of *Viola Riviniana* appears to be produced by the suppression of the spur, but the petals are all slightly pouched at the base.

THE principal historical events and appointments connected with the Royal Botanic Gardens, Ceylon, are summarised by Mr. J. C. Willis in No. 10, vol. ii., of the *Agricultural Journal*. The expansion of the gardens has not only included the formation of five branch institutions situated in different climatic regions of the island, but during the term of office of the present director the scientific staff has been increased by the appointment of several specialists. Although the introduction and investigation of plants of economic value have been carried out in Ceylon since the institution of the gardens in 1860, there has been a gradual change in the scope of the work, and systematic collection and identification have given place to physiological research and experimental cultivation.

THE skull of the dinosaur *Triceratops serratus* is described by Dr. R. S. Lull (*Bull. Amer. Mus. Nat. Hist.*, xix.). A figure of the palatal aspect shows the extreme length to be about 6 feet 4 inches.

IN the *Ottawa Naturalist* for May, Mr. L. M. Lambe describes the phalanges of the manus of *Ornithomimus altus*, which evidently had long and sharp claws. He considers that this dinosaur was capable of rapid motion in pursuit of prey, and had the power of tenaciously grasping with its fore limbs.

To vol. xv., part ii., of the *Proceedings* of the Royal Physical Society of Edinburgh, Mr. N. Annandale communicates the first instalment of a series of papers on the zoology of the Færøes, dealing in this instance with the land and fresh-water molluscs, isopods, and insects, each group being treated by a specialist.

FROM the Field Columbian Museum we have received publications of the geological series, vol. ii. In No. 3 Dr. S. W. Williston gives a detailed description of the skeleton of the American pterosaur *Nyctosaurus gracilis*, which was formerly regarded as *Pteranodon*, and in No. 4 Mr. E. S. Riggs gives a description and restoration of the dinosaur *Apatosaurus* (formerly *Brontosaurus*). Mr. Riggs remarks that there is a striking similarity between his figure and the original restoration of the genus by Marsh. Later on Marsh, evidently dissatisfied with its proportions, inserted additional vertebrae and ribs, and otherwise modified the skeleton, almost to the extent now rectified by the evidence since acquired.

THE whole of the seven articles in the first part of vol. vi. of the *Bulletin* of the College of Agriculture at Tokyo University are from the pen of Prof. C. Sasaki, all but one dealing with insects of commercial value, more especially silk-producing moths. Special interest attaches to the description, illustrated with two coloured plates of the adult insect and larva, of native methods of rearing the fine Yamamai moth (*Antheroea yamamai*). Five of the other papers treat of various races of silkworms and different modes of feeding them, while the sixth is devoted to the life-history of the wax-producing coccid *Ericerus pela*. In the eighth and last paper the author describes a new field-mouse, under the name of *Arvicola hatenedzumi*, which appears to be the Japanese representative of *A.* (or *Microtus*) *subterraneus*.

A NUMBER of experiments have been carried out by Konradi on the duration of life of pathogenic bacteria in water (*Centr. f. Bakt.*, xxxvi., No. 2, p. 203). These show that the anthrax bacillus, the *Micrococcus pyogenes aureus*, and the typhoid bacillus may ultimately displace the ordinary bacterial forms of water and survive for a long period, anthrax for 3½ years, the *M. aureus* for as long as 545 days, and the typhoid bacillus for more than 500 days, their pathogenic properties still being retained.

PROF. LINGARD raises the question whether the *Piroplasma bigeminum*, the parasite of Texas fever of cattle, can find a habitat in the human subject (*Centr. f. Bakt.*, xxxvi., No. 2, p. 214). He describes a case in which a native cattle attendant staying near bovines, the subjects of Texas fever, developed an illness partly malarial, but partly, perhaps, due to infection with the *Piroplasma*, the special symptoms being continued remittent fever unaffected by quinine, hæmoglobinuria, and the presence in the blood of parasites similar to the *Piroplasma*.

PROF. GRINDLEY and Mr. Mojonner, of the United States Department of Agriculture, have published the results of experiments on the losses occurring during the cooking of meat (*Bulletin* No. 141). The chief loss in weight during the boiling, sautéing, and panbroiling (cooking in frying

pan without fat) of meats is due to removal of water. In the roasting of meats, the loss is due to both water and fat. When beef is cooked in water, 3.25–12.67 per cent. of nitrogenous matter, 0.6–37.4 per cent. of fat, and 20.0–67.4 per cent. of mineral matter of the uncooked meat are found in the broth. In roast meat the loss is much less, 0.25–4.5 per cent. of the nitrogenous matter, 4.5–57.5 per cent. of the fat, and 2.47–27.2 per cent. of the mineral matter being found in the dripping. As a rule, the larger the piece of meat cooked by boiling or roasting, the smaller is the relative loss. Panbroiling seems to be the mode of cooking that occasions the least loss. A statement which will cause surprise to some is that beef which has been used for the preparation of beef-tea or broth has lost comparatively little in nutritive value, though much of the flavouring material has been removed.

THE Geological Survey in Ireland has just issued a memoir on the geology of the country around Belfast, with a specially prepared one-inch map of the district colour-printed to show the various drift deposits and solid strata where these appear at the surface. On the margin of the map are engraved and coloured two longitudinal sections to explain the general structure of the country—a useful feature, which serves to render this excellent map more intelligible to the uninitiated. The memoir and map are the work of Messrs. G. W. Lamplugh, J. R. Kilroe, A. McHenry, H. J. Seymour, W. B. Wright, and H. B. Muff. The description of the older rocks, from the Ordovician (or Lower Silurian) series to the Tertiary basalts, is based largely on the previous work of the Survey, supplemented by the information published by private workers. The drifts, on which the field-staff was specially engaged, are very fully described, and in the explanation of their mode of origin reasons are given for rejecting the marine theory and for adopting the land-ice theory. There is much, however, of practical as well as of scientific interest in this volume; agricultural geology is especially dealt with, and there are notes on water supply, house sites, building materials, &c., records of deep borings, petrographical notes on the igneous rocks, and a bibliography.

It may be said that the Austrian Empire covers a wide field; but its manifold activity in matters of geological research is none the less remarkable. Among recent memoirs received by us are two by Dr. W. Teisseyre on the north-eastern foreland of the Kárpáthians (*Verhandlungen der k.k. geol. Reichsanstalt*, 1903, pp. 289–308, and *Beiträge zur Paläontologie und Geologie Österreich-Ungarns*, Bd. xv., 1903, pp. 101–126). In these the author traces the influence of older movements, and of the resulting crust-blocks, on the present structure of the Podolian lands, and seeks to reconstruct the country as it was, firstly, at the time of the Cenomanian marine transgression, and, secondly, at the opening of the Miocene period. In so doing, he is led to regard an anticlinal mass in Podolia, upheaved in Upper Jurassic times, as a somewhat belated offshoot of the Triassic folds of the Sudetic. Dr. Tietze's report on the work done by the Geologische Reichsanstalt in 1903 (*Verhandlungen*, 1904, pp. 1–44) describes the distribution of the field-surveyors, and the visits undertaken to other lands. Among the papers issued under his energetic guidance in 1903, we note F. Kerner's description of the "Fenster," or pseudo-inliers, of the Mosor Planina, where little patches of Eocene Flysch appear in the floor of hollows excavated naturally through Cretaceous limestone. Other evidence is forthcoming to show that the latter series has been thrust over the former. W. Hammer

(*Verhandl.*, 1903, p. 345) contributes a valuable paper on pegmatites in the Ortler Alps, in which he opposes the still popular view that such veins have been formed by lateral segregation from the surrounding rocks. Dr. Romberg (p. 365) adds yet another paper to the discussion of the inter-relations of the Monzoni rocks, in which he tilts vigorously against Dr. Doelter and his associated champions.

A TENTH edition of Mr. A. Jamieson's "Elementary Manual on Steam and the Steam Engine" has been published by Messrs. Charles Griffin and Co., Ltd.

MARCONI'S Wireless Telegraph Company, Ltd., has published a catalogue dealing with Röntgen ray and high-frequency apparatus, instruments and accessories. The pamphlet, which is well illustrated, contains numerous useful hints as to the use of induction coils and the charging of batteries. Particulars as to the cost of instruments described are conveniently arranged, and the catalogue should be of service to workers in these branches of science.

WE have received a copy of the *Bulletin* for November, 1903, published by the Permanent International Council for the Exploration of the Sea, the contents of the first part of which were described in the issue of *NATURE* for June 9, p. 139. The present *Bulletin* is divided into four parts, dealing respectively with the following subjects:—the condition of the atmosphere and of the surface water; the temperature and salinity at various depths expressed in metres; the nitrogen, oxygen, and carbonic acid dissolved in sea-water; plankton tables for Finland, Sweden, Denmark, Germany, Holland, Belgium, England, Scotland, and Russia. Attached to the several parts are numerous charts showing the results arrived at by observers of different countries. The *Bulletin* may be procured from MM. Andr. Fred. Høst et Fils, of Copenhagen.

THE April number of the *American Journal of Psychology* contains a paper by Mr. C. Spearman entitled "'General Intelligence' Objectively Determined and Measured." By means of statistical methods of considerable refinement and elaboration, the writer claims to have proved that an absolute correspondence exists between the degree of general intelligence and general power of sensory discrimination, and that there is a variable correspondence between the latter and the more complicated intellectual activities of practical life. He believes in an underlying universal unity of the intellectual function, the psychical nature of which is to be discussed in a later paper.

THE second part of the first volume of the *British Journal of Psychology* was issued on June 10. It contains four papers and the proceedings of the Psychological Society. Dr. C. S. Myers writes on the taste-names of primitive peoples, and refers to the results of a few experiments he made with Dr. Seligmann in the islands of the Torres Straits. He found that the literal meaning of the phrase commonly used in the Torres Straits to denote sweetness is "tasting good"; that the same phrase is applicable to denote saltness, the usual word for which is derived from sea-water; the taste-names for salt and sour tend to be confused; and there is no specific name for the bitter taste. Precisely similar features are found when the taste-names of Indo-Germanic languages are examined. Dr. Myers extends his inquiry to other primitive peoples, and the results are given in his paper. Mr. W. H. Winch has a paper on immediate memory in school children. Prof. R. Latta contributes notes on a case of successful operation for con-

genital cataract in an adult, and Prof. W. McDougall deals with the variation of the intensity of visual sensation with the duration of the stimulus.

A VERY readable paper on radium, by Mr. E. P. Poulton, is contained in the March issue of the *Transactions* of the Oxford University Junior Scientific Club.

WE have received *Communications* No. 87 and No. 88 from the physical laboratory of the University of Leyden. In the first of these Dr. Kamerlingh Onnes describes the methyl chloride circulation used in the cryogenic laboratory, and in the second the results of the determination of the isothermals of mixtures of oxygen and carbon dioxide by Dr. W. H. Keesom are given.

IT is well known that the extension of the theory of the asymmetric carbon atom by Wislicenus to account for the isomeric relationships of ethylene derivatives is in many cases unable to explain observed experimental facts. In the current number of the *Zeitschrift für physikalische Chemie*, vol. xlviii. p. 40, Dr. Pfeiffer shows how it is possible to account for many of these observations by a modification of the van 't Hoff-Wislicenus theory. With this modification the formation of the *cis*- or *trans*-isomer can be predicted, whether the ethylene compound is obtained from an ethane or an acetylene compound.

THE Carnegie Institute of Washington has just issued a pamphlet (No. 7) containing an account of a new method for determining compressibility by Messrs. T. W. Richards and W. N. Stull. Bromine, iodine, carbon tetrachloride, chloroform, bromoform, water, and mercury have been examined. In the case of a substance like bromine, the liquid is hermetically enclosed in a very thin, flexible glass bulb, and subjected to compression under mercury, correction being made for the change in volume of the mercury and the glass. A new form of high pressure manometer is described the working of which depends upon the difference between the compressibility of water and mercury.

IN a recent experimental investigation by Dr. T. Wulf, published in the *Zeitschrift für physikalische Chemie* (vol. xlviii. p. 87), it is shown that the electromotive force at which hydrogen ions are liberated from solution, when determined galvanometrically, is quite independent of the pressure when this is varied between 0.01 and 800 atmospheres. On the other hand, the polarisation of the hydrogen electrode increases with the pressure, and this increase is in quantitative agreement with Helmholtz's formula. The experiments show very clearly that the passage of a current through the solution is not necessarily accompanied by the liberation of the gas in the form of bubbles.

THE question as to whether the so-called colloidal or pseudo-solutions are essentially different in character from ordinary solutions has been the subject of much discussion and experimental investigation of late years. By applying the optical method of Tyndall to solutions, Messrs. Lobry de Bruyn and Wolff, in the *Recueil des Travaux chimiques de Pays-Bas*, vol. xxiii. p. 218, arrive at the conclusion that there is no sharp line of demarcation between ordinary solutions and pseudo-solutions. Solutions of bodies of high molecular weight, such as tristearine and the hexabenzoyl derivatives of mannite and dulcite in methyl alcohol, chloroform and acetic ether, exhibit optical properties of the same nature as colloidal solutions. Light is reflected laterally from a beam incident on the solution, and this reflected light is polarised.